

REMARKS

Applicant affirms its election of Group II, claims 22-29.

The rejection of claims 22-29 under 35 U.S.C. 103(a) as being unpatentable over Mizukoshi (US 5,098,342) in view of the admitted prior art (reference pages 0003-0004 of instant specification) is respectfully traversed.

Claim 22 recites a steel spider comprising a hub and a plurality of angularly spaced trunnion shoulders extending from the hub. Each of the trunnion shoulder has a trunnion shoulder surface and a corresponding plurality of angularly spaced trunnions extending from the plurality of trunnion shoulders. The trunnion surfaces and trunnion shoulder surfaces having a hardened case formed by an induction heat treatment.

Mizukoshi describes a tripod type constant velocity joint; however, Mizukoshi does not mention nor discuss heat treating the joint. The office action references paragraphs 0003-0004 of the applicant's background for establishing a nonobviousness rejection for heat treating the joint. Paragraph 0003 references the type of material used to form the spider in addition to the ranges of hardness of the case. Paragraph 0004 describes carburizing, a known method of heat treating, or hardening the entire component. Carburizing is a method of heat treatment that includes introducing carbon into the surface layer of steel that has a low carbon content. This process includes exposing the component to a carbon atmosphere (i.e., liquid or gas). The depth of the penetration of carbon into the surface is controlled by the time and temperature of the treatment. The component is thereafter hardened by heating to a respective temperature and quenching the component. All exposed surfaces (i.e., interior and exterior) are penetrated and case hardened.

The article as hardened by the induction heat treatment recited in claim 22 case hardens only those surface areas exposed to the induction heat coil. That is, the selective application of heat in only the areas where high hardness is desired provides more control over the hardness and properties of the

(10/643,363)

critical areas requiring case hardening while eliminating exposure to those critical areas where distortion is not wanted. For example, the internal structure of the article includes splines. Exposing the splines to heat treatment could cause heat treatment distortions to these critical areas where freedom from irregularities is demanded. The article heat treated by the induction heat treatment process would not expose the splines to any induction heat treatment. Exposure to those critical areas that require high tolerances be maintained without irregularities would form distortions as a result of the heat treatment according to the admitted prior art. Such distortions would cause the component to become un-usable or difficult for further assembly.

The carburization process would expose the entire article (i.e., internal and external surfaces) to the carbon atmosphere since the entire article is immersed in the gas or liquid medium. Induction heat treating the article according to the present invention allows for selective sections of the component to be case hardened while leaving those critical areas which require no distortions or irregularities untreated and unaffected. The end result is an article that is case hardened in only those selective areas which require case hardening as opposed to an article having all surfaces case hardened including those critical areas that require no distortion. Therefore, the article made is very different from the article in Mizukoshi.

Mizukoshi and the referenced prior art sections cited by the office action fail to teach or suggest the induction heat treated article of claim 22. Therefore, rejection of claim 22 should be withdrawn.

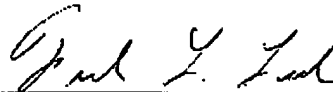
Claim 23 more specifically recites an induction heat treatment process using an induction coil. The article formed by the induction heat treatment process includes an induction heat treated article case hardened in only those selective areas which require case hardening as opposed to case hardening the entire article including those critical areas that require no distortion. Mizukoshi and the admitted prior art referenced section fail to teach or suggest the induction heat treated article. Therefore, the rejection of claim 23 should be withdrawn.

(10/643,363)

Claims 24-29 depend from claim 22 and are therefore allowable.

In view of the foregoing amendment and remarks, all pending claims are in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,



Frank L. Lollo
Reg. No. 48,854

MacMillan, Sobanski & Todd, LLC
One Maritime Plaza, Fourth Floor
720 Water Street
Toledo, Ohio 43604
Tel: 734-542-0900
Fax: 734-542-9569

(10/643,363)

6